Implementation Study for the National Broadband Network – A riposte

Submission

C-COR Broadband

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Abstract

The author asserts that Cable Broadband is a valid infrastructure for the delivery of superfast broadband. Cable operators drive industry innovation and create competitive tension for better economic performance and social outcomes. The author shares his unease and senses that particular sectional interests are dominating policy making and expresses a growing belief that there should be a vigorous discussion on this issue leading in the absence of a strong Independent Centre for National policy.

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First principles – an overview

In commenting on the Implementation Study Report (Report) prepared by McKinsey and KPMG for the Government of Australia and the NBN Co Board of Directors, I accept that we are just interested observers and clearly not privy to the supporting information not included in the public record.

After reading the Report I have a number of observations and concerns about the apparent disregard for technologies other than FTTH, especially the apparent lack of interest by the Authors of this report and the Panel of Experts who recommended the FTTH approach without careful assessment and proper due diligence of the broader responses from wireless and in particular the cable broadband eco-system.

(This leads to some unease and a sense that particular sectional interests are dominating policy making and a growing belief that there should be a vigorous discussion on this issue leading in the absence of a strong Independent Centre for National policy).

In particular, I and technologists at Verizon, a traditional PTT operator and world leading RF overlay expert, are surprised by the posturing on 'RF Overlay'. We consider it as a given for the delivery of video content.

I am also concerned by the apparently deliberate understatement in the following précis of cable's capabilities vis-à-vis:

The Assertion	Reference	The Facts
Cable would deliver much slower upload speeds	Page 21	Cable modems can deliver 8-bonded down-stream channels and four upstream channels approximate to 320Mb/s and 120Mb/s line speeds respectively. The report's authors are confused between infrastructure capability and marketing of broadband services.
Cable has a less certain upgrade path	Page 21	The authors and NBN Experts did not undertake rudimentary research to discover that Next Generation Cable is based on ITU-T PON architecture.
Cable has a less certain upgrade path	Page 21	The big unresolved issue for cable operators is the Local Government Planning Laws that complicate delivering services to MDU. The cable networks can be built as a contiguous infrastructure platform. The Australian networks were designed to target high value customers that wanted premium services.
While HFC networks are capable of high connection speeds, a download speed of 100 Mbps on HFC is not equivalent to a speed of 100 Mbps on an FTTP network.	Page 106	Clearly the author is not a Telecommunications Engineer.
HFC networks may struggle to keep pace with upgrades to the fibre network, particularly in the long term	Page 106	This underscores the lack of due diligence by the Panel of Experts, the Department, and McKinsey & KPMG.
HFC networks share bandwidth between end users connected to a node in the HFC network. ...as more users connect to a node in the HFC network, contention for bandwidth available on a node increases.	Page 107	Let us be simple. A GPON network is a shared network subject to contention, too.

Table 1. Flawed Assertions

However I am encouraged by some aspects of the Report and NBN Co statements that aerial builds will be the accepted norm for the new network builds – just like the existing cable networks – extending the definition of low-impact facilities in current telecommunications laws to include overhead cables and poles.

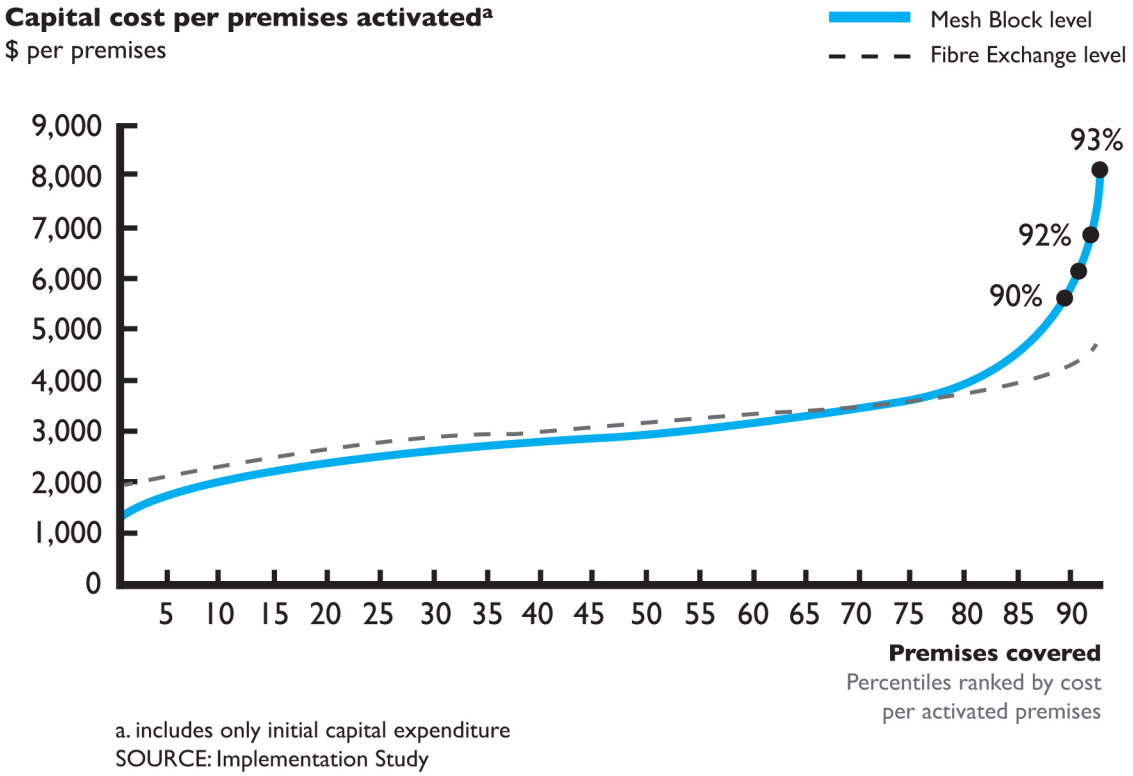
Of deep concern is the Reports assessment of costs implicit in Exhibit 1-3. FTTP cost curve (93 percent coverage).

A simple analysis of information readily available on the public record would say that around the western world, the bench mark average network cost to build a fixed broadband network is between $1600 and $1900 per premises connected. Surprisingly in the Exhibit it soars to an average of $8,400 at the ABS Mesh Block level. Within this average, we can reasonably extrapolate that specific instances will reach $27,000 per premises connected e.g. off the beaten dirt road or a heritage building.

(I accept that the NBN is based on a nation-building broadband vision and I don't have a problem with that but at these costs it is likely to be over capitalized and any future privatization, like Telecom Australia (TELSTRA), would be in jeopardy, unless there is a government subsidy?)

If the NBN Co network is built within the cost curve as shown in the Exhibit 1-3, I question how will it be able to translate that cost burden to a wholesale price – not a retail price – that approximates the current regulated ULLS $16 per month?

Exhibit 1-3. FTTP cost curve (93 percent coverage)



a. includes only initial capital expenditure
SOURCE: Implementation Study

Without access to the raw data to cross check my assessment I see that the average cost per premises connected at 30% coverage will be about $2500. Compare this to the under-utilized cable broadband networks of Neighbourhood Cable, Optus and Telstra - which cover some 7 million Australians or about 25% of premises – where the estimated incremental cost to modernize these networks is about $350 each; **To date the Authors of the Report, the Panel of Experts, The NBN Co and the Government appear to have ignored this compelling opportunity to significantly reduce the implementation cost of the NBN Rollout.**

There is a real possibility that Australia will end up with a flawed industry structure that will lead to distortions in investment decisions by broadband infrastructure carriers.

A recently published industry technical paper (Access Network Build Comparison, Burke & Eagles 2010) prepared for industry peer-review by Liberty Global Inc. http://www.lgi.com included the following table of numbers, Table 2 Greenfield Cost per Home Passed.

I draw your attention to the row labeled 'Greenfield Low Density Aerial' which states the cost to build a network for GPON and cable is US$1438 and $700 respectively.

Independently, C-COR Broadband has previously stated that the cost structure for Next Generation Cable (a FTTP architecture) using PON architecture will be comparable to HFC n+0 (Table 2).

	LTE (US$)	HFC n+3 (US $)	HFC n+0 (US $)	GPON (US$)
Greenfield High Density Underground	$106	$381	$374	$700
Greenfield High Density Aerial	$106	$124	$140	$231
Greenfield Low Density Aerial	$296	$700	$700	$1,438
Greenfield Low Density Underground	$296	$1,080	$1,229	$1,871

Table 2. Greenfield cost Per Home Passed

Let me again remind you that the Panel of Experts and its significant academic resources did not investigate or research the capabilities' of cable. **They dismissed it outright as a redundant network technology.**

They incorrectly say that cable is not up to the task of GPON. Their poorly researched and biased contribution has shaped the policy framework to specifically exclude cable as a next generation architecture; unlike Ofcom, the Independent regulator and competition authority for the UK communication industry who accept cable as a key contributor to a vibrant marketplace. Similarly the US Government's FCC would be alarmed if the cable operators were removed from broadband delivery as they have won approximately 55% market share against the traditional PTT operators like Verizon and AT&T and contribute significantly to maintaining a strong competitive downward pressure on prices.

Another example of poor research ending up in a biased contribution is in the Implementation Report prepared by McKinsey and KPMG. McKinsey correctly note, as more of a byline than a substantive statement, that Portugal Telecom (Portugal's equivalent of Telstra) spun off its cable networks to a new business ZON Multimedia in 2007, but fail to make any mention of its success. In fact, this new entity in the market place has held its market share (it was always a significant player in Portugal), introduced new services and forced Portugal Telecom (its one time parent) to invest in new FTTH infrastructure.

Competition between communication network operators and service providers is alive and well in Portugal, but at risk in Australia because the policy makers here are getting poorly researched and biased advice that can only result in a high cost and inflexible NBN; the blinkers are on and unless a drastic change in thinking towards existing cable networks occurs Australia will end up with a second rate communication network.

Our policy makers and their advisors do not appear to recognise that cable broadbands cost advantage is a significant threat to a commercially driven NBN Co building a GPON network.

If Liberty's assessment is correct, then Cable Broadband has a 2:1 cost advantage over GPON for new greenfield builds.

This leads to only one conclusion - The NBN Co will have to take the cable networks out of business or battle with a vigorous competitor or exist on heavy state subsidy from Australia's tax payers forever.

It beggers belief that the Report did not investigate this comparative cost disadvantage as part of a confidential cost-benefit study, and if it did why has it has not moved to convince the NBN Co and the government that Cable needs to be accepted as an integral part of the next generation architecture?

Oh to be a cable broadband operator. I'm sure a broadband cable operator would relish competing with a high cost NBN Co on the one side without needing to compete with a low cost copper network on the other.

However it would be much more in the national interest as well as all those involved if the existing cable networks were included rather than excluded from this brave new world.

Appendix

Reference 1

RF Overlay

Optical transmission is becoming more popular in the access network due to the increasing demand for bandwidth. The most advertised transport solutions for optical access are Ethernet based PON (EPON) and gigabit-capable PON (GPON), and the issue is which one to choose when establishing a new access network.

RF Overlay Adds Value

FiOS TV is hybrid RF & IP

- Broadcast video over RF
- IP-based Video on Demand (VoD)
- All digital in 2008

1550nm wavelength

- 860 MHz (~810 MHz useable) provides up to 135 QAMs
- One (6 MHz) QAM can carry ~38 Mbps, mpeg2
  - 10 SD channels
  - 2 HDTV channels
- Sized for 150 HD & 400 SD channels (≈125 QAMs)

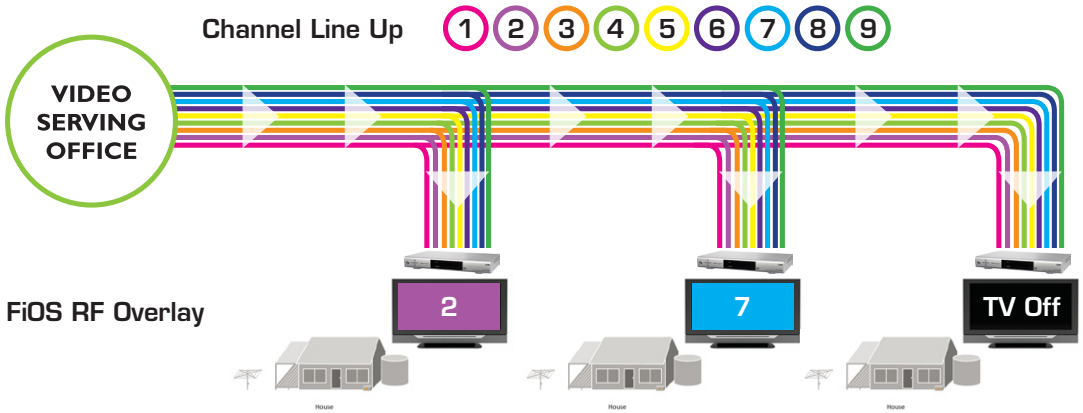


Table 3. Verizon's FiOS GPON+Video architecture delivers massive video rich content

Around the world FTTP solutions supports both IPTV and RF video overlay with return (SCTE-55-1 2009), and use technologies that enhance video delivery and service management. Refer to Table 3.
Reference 2

GPON and GePON: What are the differences?

GPON is evolving; the specifications of GPON are subject to ongoing discuss and development by the ITU-T and FSAN bodies. By definition, GPON requires the complexity of supporting multiple protocols through translation to the native Generic Encapsulation Method (GEM) transport layer using emulation that provides support for ATM, Ethernet and WDM protocols. This added complexity and lack of standard low-cost 2.5/1.25 Gbps optical components has delayed industry development of low-cost, high-volume GPON devices.

GE-PON or Ethernet in the First Mile has been ratified as the IEEE 802.3ah EFM standard and is already widely deployed in Asia. It uses Ethernet as its native protocol and simplifies timing and lowers costs by using symmetrical 1 Gbps data streams using standard 1Gbps Ethernet optical components. Like other Ethernet equipment found in the extended network, Ethernet-based FTTH equipment is much lower-cost relative to ATM-based equipment and the streamlined protocol support for an extended Ethernet protocol simplifies development. In September 2009, the IEEE ratified the 10G standard better known as IEEE Std. 802.3av - which is backward compatible with 802.3ah EPON. Commercial products are expected in 2010.

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